

Pericardial Effusion or Epicardial Fat? Improved Discrimination with Phase-Sensitive Inversion Recovery MRI.

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Introduction: Pericardial effusion is a common clinical finding with potentially important implications but is easily missed using SSFP (FISP) cine and gadolinium enhanced magnitude-reconstructed inversion recovery (Mag-IR) images due to poor contrast vs. epicardial fat despite markedly different T1. Phase-sensitive inversion recovery (PS-IR) has been validated for infarct imaging and has a number of benefits. We proposed that PS-IR would better differentiate pericardial effusion from epicardial fat because PS-IR maintains the polarity of short and long T1 tissues. **Methods:** From 392 consecutive patient reports, 53 patients had a pericardial effusion (trace=28, mild=14, moderate=8, severe=3). The signal intensity of epicardial fat and pericardial effusion was measured in 14 patients imaged with all methods (SSFP, Mag-IR, PS-IR) who had more than a trace effusion. **Results:** The signal intensity of fat and effusion were similar using SSFP ($p=NS$) or Mag-IR ($p=NS$). Using PS-IR, the fat is bright (positive) but the effusion is dark (negative) ($p<0.001$). The PS-IR image demonstrates a dark pericardial effusion (arrows), bright epicardial fat, and dark normal myocardium. Qualitatively, trace effusions showed the same findings. **Conclusion:** While the most commonly used cardiac MRI parameters have poor contrast between pericardial effusion and epicardial fat, PS-IR reconstruction provides high quality delayed hyperenhancement images and detects effusion without lengthening the typical exam.

